Microprocessor and Computer Architecture

UE21CS251B

4th Semester, Academic Year 2022-23

Date: 20/01/23

Name: Nikhil Girish	SRN: PES2UG21CS334	Section: F

Week#____1_____ Program Number: ____1___

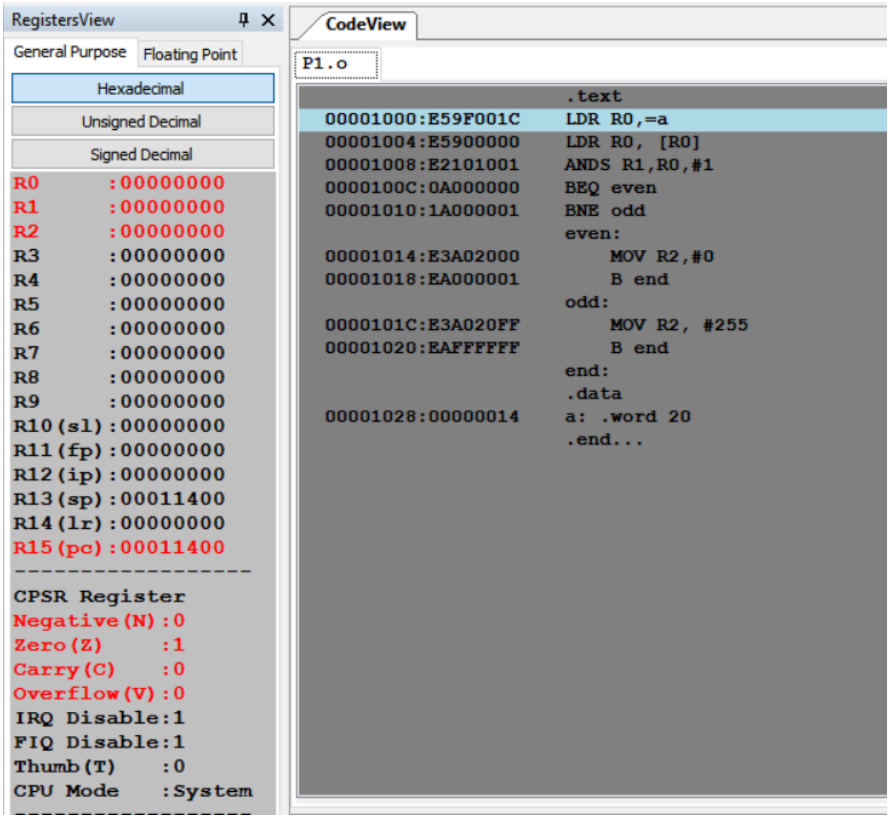
Title of the Program

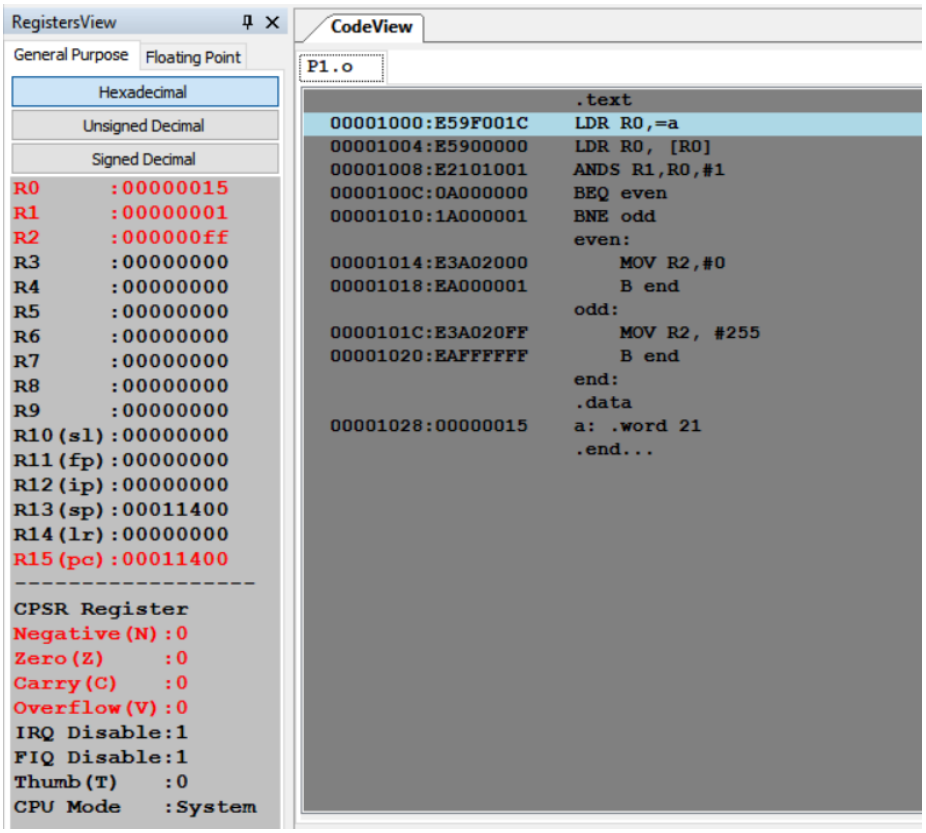
Write an ALP using ARM instruction set to check if a number stored in a register is even or odd. If even, store 00 in R0, else store FF in R0

I. ARM Assembly Code:

```
.text
LDR R0,=a
LDR R0, [R0]
ANDS R1,R0,#1
BEQ even
BNE odd
even:
    MOV R2,#0
    B end
odd:
    MOV R2, #255
    B end
end:
.data
a: .word 20
.end
```

II. Output Screen Shot (Two):


RegistersView
General Purpose
Floating Point
Hexadecimal
Unsigned Decimal
Signed Decimal
R0 :00000000
R1 :00000000
R2 :00000000
R3 :00000000
R4 :00000000
R5 :00000000
R6 :00000000
R7 :00000000
R8 :00000000
R9 :00000000
R10(sl):00000000
R11(fp):00000000
R12(ip):00000000
R13(sp):00011400
R14(lr):00000000
R15(pc):00011400
CPSR Register
Negative(N):0
Zero(Z) :1
Carry(C) :0
Overflow(V):0
IRQ Disable:1
FIQ Disable:1
Thumb(T) :0
CPU Mode :System
CodeView
P1.o
.text
00001000:E59F001C LDR R0,=a
00001004:E5900000 LDR R0, [R0]
00001008:E2101001 ANDS R1,R0,#1
0000100C:0A000000 BEQ even
00001010:1A000001 BNE odd
even:
00001014:E3A02000 MOV R2,#0
00001018:EA000001 B end
odd:
0000101C:E3A020FF MOV R2, #255
00001020:EAFFFFFF B end
end:
.data
00001028:00000014 a: .word 20
.end...



The output should be verified for both even and odd numbers.

Microprocessor and Computer Architecture

UE21CS251B

4th Semester, Academic Year 2022-23

Date:

Name: Nikhil Girish	SRN: PES2UG21CS334	Section: F

Week#____1_____ Program Number: ____2___

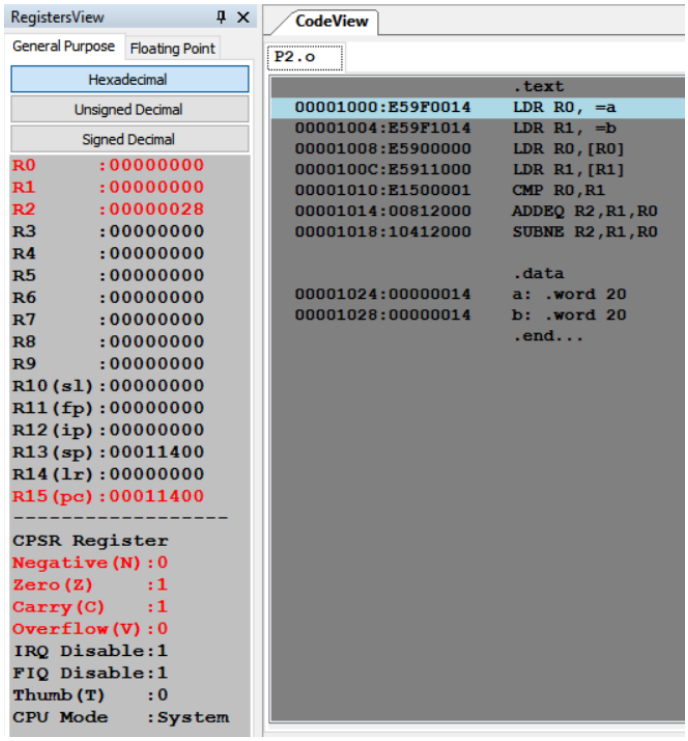
Title of the Program

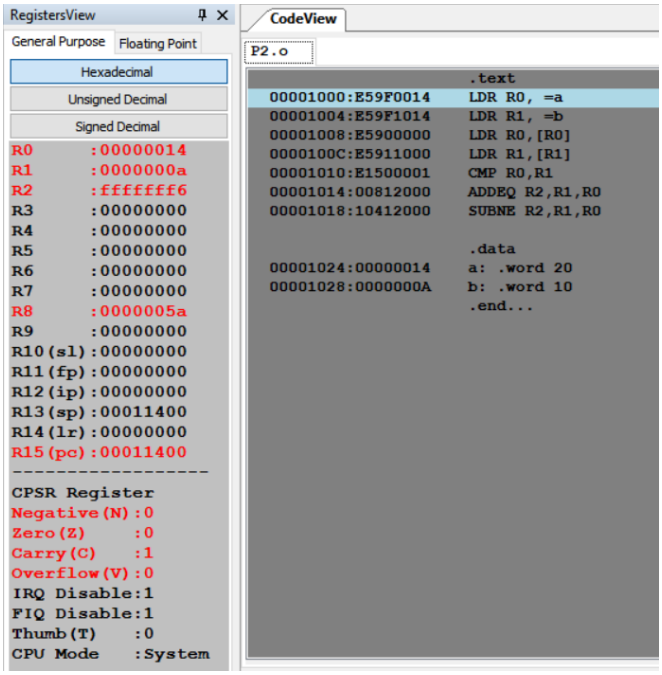
Write an ALP to compare the value of R0 and R1, add if R0 = R1, else subtract

I.ARM Assembly Code:

```
 .text

LDR R0, =a
LDR R1, =b
LDR R0,[R0]
LDR R1,[R1]
CMP R0,R1
ADDEQ R2,R1,R0
SUBNE R2,R1,R0

.data
a:  .word 20
b:  .word 20
.end
```

II. Output Screen Shot (Two):





The output should be verified for both equal and nor equal values

Microprocessor and Computer Architecture

UE21CS251B

4th Semester, Academic Year 2022-23

Date:

Name: Nikhil Girish	SRN: PES2UG21CS334	Section: F

Week#____1_____ Program Number: ____3___

Title of the Program

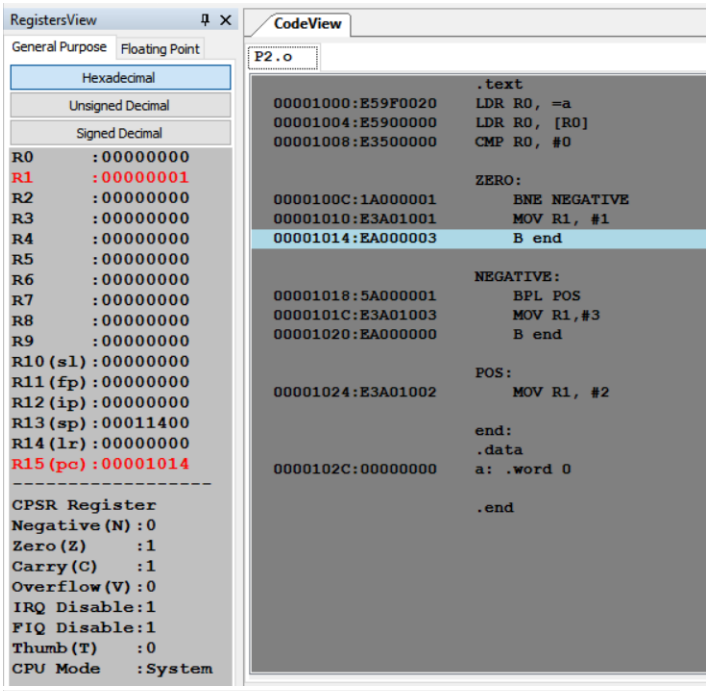
Based on the value of the number in R0, Write an ALP to store 1 in R1 if R0 is zero, Store 2 in R1 if R0 is positive, Store 3 in R1 if R0 is negative. (Program shown in class)

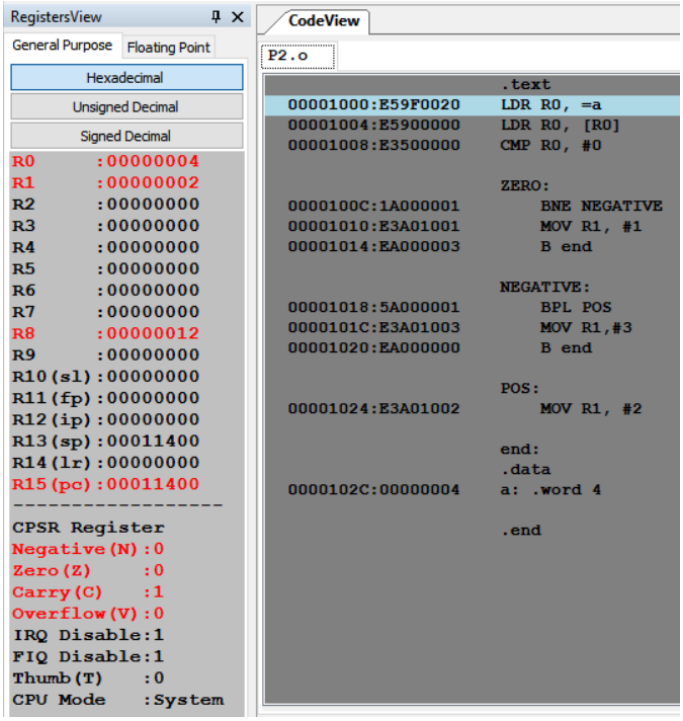
I.ARM Assembly Code:

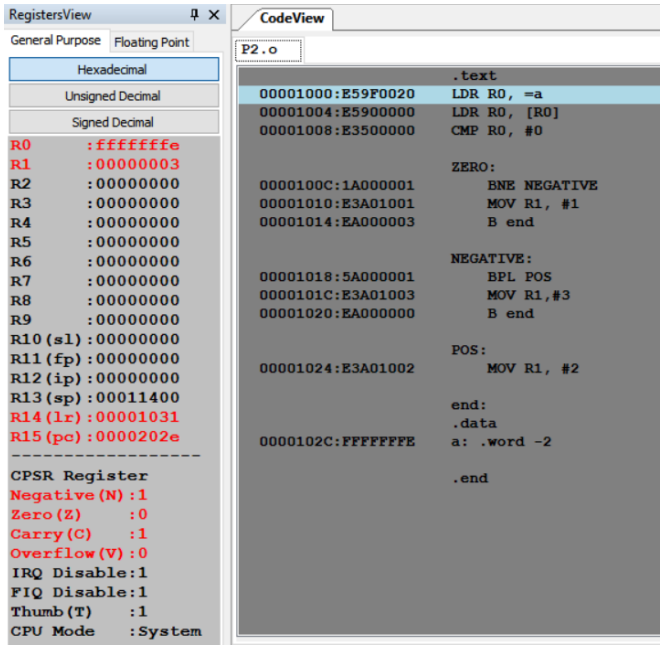
```
.text
LDR R0, =a
LDR R0, [R0]
CMP R0, #0

ZERO:
    BNE NEGATIVE
    MOV R1, #1
    B end

NEGATIVE:
    BPL POS
    MOV R1,#3
    B end

POS:
    MOV R1, #2
```

```
end:
.data
a:  .word -2

.end
```

II. Output Screen Shot (Three):



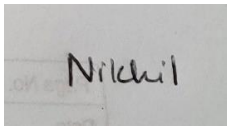




The output should be verified for zero, positive and negative cases.

Disclaimer:

- The programs and output submitted is duly written, verified and executed by me.
- I have not copied from any of my peers nor from the external resource such as internet.
- If found plagiarized, I will abide with the disciplinary action of the University.

Signature: 

Name: Nikhil Girish
SRN: PES2UG21CS334
Section: F
Date: 23.01.2023